

2017 Annual Report

Fire Management Section

Forest Resources Division



2017 Forest Resources Division Fire Management Section

Annual Report Summary

Character and Extent of Fire Season

Fire danger was lower than average in 2017. May and September showed increased fire danger and occurrence. Forty-five percent of fires occurred on days with a "high" fire danger rating, indicating the number of very high and extreme days were lower this year.

Rating	% of Days
Extreme	1
Very High	1
High	19
Moderate	24
Low	55



Wildfire Occurrence

In 2017, 178 reportable fires (57% of average) occurred on 568 acres (9% of average). There were no significant large fires this year. In total, Forest Resources Division responded to 271 fires.

*Ten-year average includes Sleeper Lake and Duck Lake fires.

Fire Cause

Debris burning - 32%
Miscellaneous - 17%
Powerline - 16%
Equipment - 11%
Campfire - 9%
Arson - 6%
Lightning - 4%
Fireworks - 2%
Structure - 2 %
Smoking - 1%



Fire Planning

Staff attended more than 125 local meetings. Plans are updated yearly with the U.S. Forest Service, Bureau of Indian Affairs, Fish and Wildlife Service, the state of Wisconsin, Great Lakes Forest Fire Compact, Michigan National Guard, Michigan State Police, National Weather Service, and other DNR divisions.



Air Operations

Law Enforcement - 65.5 hours
Eagle Surveys - 311.9 hours
Forest Resources - 470.2 hours
Wildlife - 736.5 hours
FRD purchased three unmanned aerial systems to supplement air operations capabilities.



Division	# of Burns
Wildlife	83
Parks	20
Forest Resources	8
Total	111

Prescribed Fire

In 2017, 111 burns were completed on 9,317 acres. The average over the last ten years was 84 burns on 5,403 acres.



Out of State Assignments

FRD conducted nearly 140 dispatches to 13 states and two Canadian provinces including: Idaho, Oregon, Washington, Montana, Missouri, Oklahoma, Florida, Arizona, Nevada, Wyoming, West Virginia, California, British Columbia, and Ontario. In total, there were 34 engine assignments, 42 single-resource assignments and 39 crew assignments. A total of 133 individual firefighters went on out-of-state assignments.



Equipment

FRD maintains approximately 350 pieces of rolling stock fire equipment. Of these, 184 pieces (52%) are 20 years old or older and 75 pieces (21%) are 30 years old or older. In 2017, FRD received a second allocation of \$1 million for fire equipment replacement.



Training

In 2017, FRD staff received 11,660 hours of fire training from 26 different courses. Thirty staff received new fireline qualifications. FRD staff also provided fire training to cooperators and emergency services agencies which included 2,503 students for 30,000 hours in 12 different courses.



Fire Prevention

Staff spent 2,198 hours educating 130,935 members of the public on fire prevention.

- Burn permits web traffic: 134,139
- Burn permits phone contacts: 46,170 views
- Fire management website traffic: 21,440 views
- Public service announcements: 12,457
- Digital impressions: 10 million



Assisting local fire departments

In 2017, through the Federal Excess Property Program, the DNR placed 44 pieces of equipment and received 21 pieces of equipment valued at \$5.1 million. The DNR Rose Lake Warehouse depot handled 548 pieces of equipment valued at \$4.2 million and placed 65 pieces of equipment with a value of \$1.7 million.

Volunteer fire assistance grants

In 2017, grants were awarded to 81 fire departments for a total of \$186,250.

Legislation

In 2017, House Bill 5198, sponsored by State Rep. Sue Allor, was introduced to change the Natural Resource and Environmental Protection Act, 1994 PA 451, Part 515, Section 51514 to allow the DNR to enter into agreements with other states, the federal government and the provinces of Canada for all-hazard response. The current law allows for agreements for forest fires only. The change will allow DNR staff to assist our neighbors and partners across the country in their time of need for natural disasters and other emergencies.



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Forest Resources Division Fire Management Section

The Natural Resources and Environmental Protection Act, Act 451 of 1994, Part 515 Prevention and Suppression of Forest Fires states that “the department (DNR) shall have charge of the prevention and suppression of forest fires and shall appoint assistants as needed to implement this part.”

The Forest Resources Division (FRD) Fire Management Section is responsible for statewide fire program oversight and is located in the FRD central office in Lansing. The section consists of the section manager, two fire specialists, the federal excess property coordinator and section secretary. The section also includes the aviation manager located in Roscommon and four pilots located in Roscommon, Newberry, Escanaba and Houghton. Staff at the Forest Fire Experiment Station (FFES) and Roscommon Equipment Center (REC) also report to the section. The FFES and REC staff consist of one manager, one engineer, one draftsperson, one machinist, one welder and one heavy equipment mechanic, all working in Roscommon.

The section provides fire program direction, develops policy and oversees budget at the central office. Field operations, managed by FRD’s field coordinator, carries out fire program operations at two Incident Coordination Centers in Roscommon and Marquette, four district offices, 17 management unit offices and 30 field offices. A variety of FRD staff and other DNR staff assist with fire suppression at these locations, directly on the fireline and in overhead or support roles. In 2017, 402 staff underwent fitness testing for fireline duty. Numerous other staff assist on incident management teams and in other

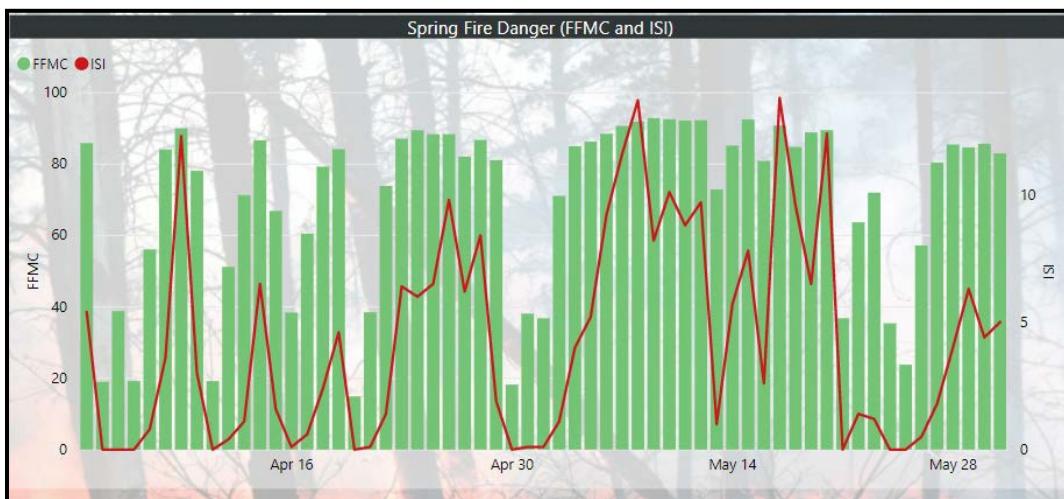
support roles.

FRD maintains four incident management teams that are well-organized and available to manage large or complex wildfires. These teams have also been called upon to assist other DNR divisions and state agencies with all-hazard incidents over the past few years.

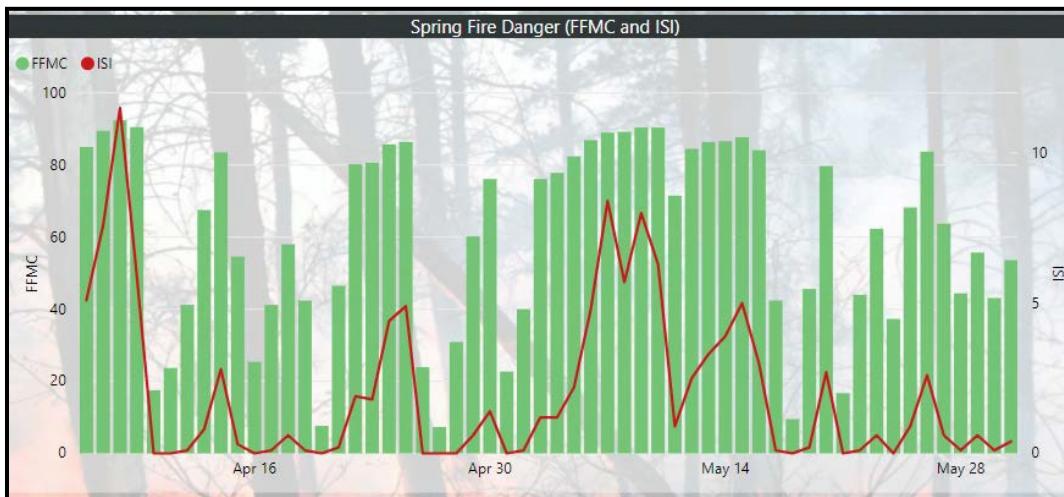
This report will highlight many of the program priorities and accomplishments as well as describe weather and fire danger ratings, fire occurrence and assistance provided to federal and state agencies across the country.

Character and Extent of Fire Season

Mio Weather Station Spring Fire Danger



Gwinn Weather Station Spring Fire Danger

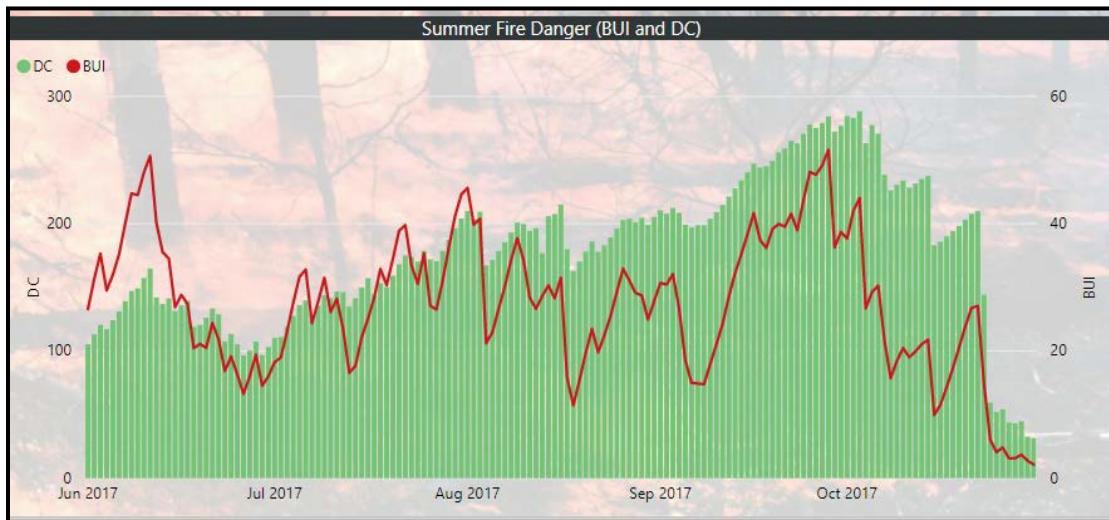


In the spring, the Fine Fuel Moisture Code (FFMC), which refers to drying of the finer fuels such as leaves and grass, is used along with the Initial Spread Index (ISI), which is wind and FFMC combined, to provide a rating on how easily a fire will start and spread. The higher those numbers, the more easily a fire will start. FFMC over 85 and ISI over 6 means fires will start and spread easily, whereas FFMC of 90 and ISI of

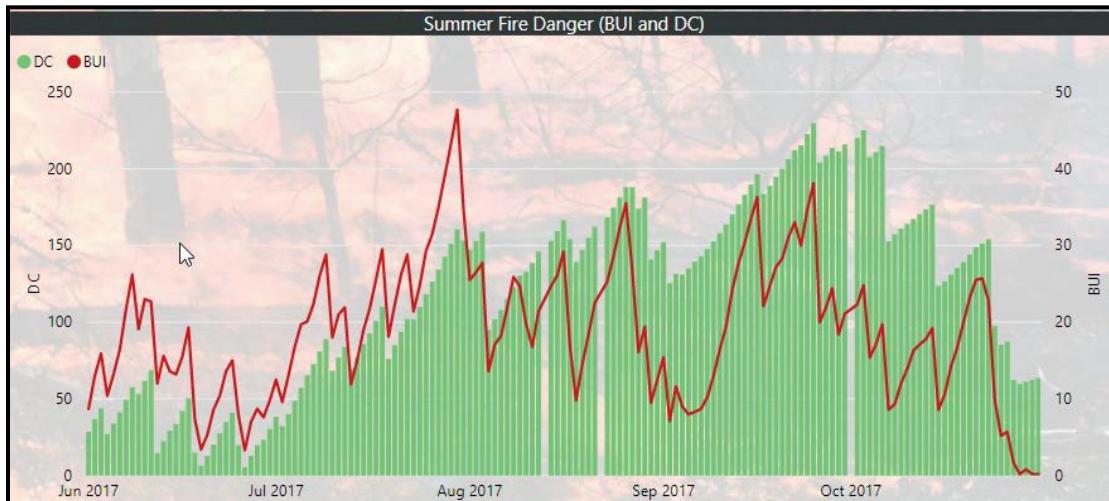
10 means conditions will support extreme fire behavior. The graphs above of 2017 spring fire danger conditions in the Mio and Gwinn areas are an example. The highest risk days are when both the FFMC and ISI are up; when they are lower, such as rainy or cooler days, the risk is lower.

These charts are typical of the fire danger conditions experienced throughout the state in April and May. Through that time period, both the Mio and Gwinn areas experienced similar weather events from May 3 through May 16 with FFMCs reaching near and above 90 and ISIs between 8 and 13, meaning that stretch of weather provided significant fire danger days. This coincides with the higher numbers of fires occurring on May 6, 11, 12, 14, 15, and 18 as can be seen in the charts in the Fire Occurrence section.

Mio Weather Station Summer Fire Danger



Gwinn Weather Station Summer Fire Danger



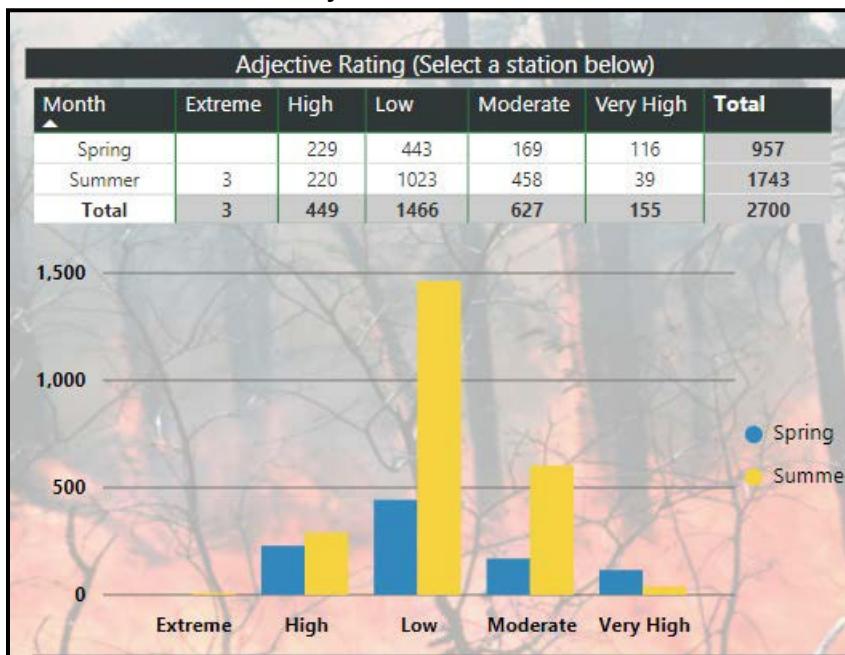
“Green up” is a term used when most of the new growth in the forests has appeared and dominates the landscape. This usually happens in the Lower Peninsula around June 1 and in the Upper Peninsula

around June 10. This year, green up was right on schedule. After green up is declared, we convert to using summer fire danger criteria.

FRD uses the Canadian Forest Fire Danger Rating System CFFDRS to rate the risk of wildfires in Michigan. Fire danger is a general term used to express a variety of factors in the fire environment, such as ease of ignition and difficulty of control. Fire danger rating systems produce qualitative and/or numeric indices of fire potential, which are used as guides in a wide variety of fire management practices.

In the summer the CFFDRS uses the Build Up Index, or BUI. It indicates the total amount of fuel available to burn and combines drought and duff moisture and the ISI as mentioned above. Typically in the summer, when the BUI reaches 70, heavier fuels begin to burn and fires burn deeper into the ground. This means fires become harder to fully extinguish and more intense. If the BUI reaches 100 across a significant part of the state, spring criteria is used to determine fire danger. The graphs above are an example of the summer rating for the same weather stations near Mio and Gwinn. As the chart shows, the BUI and Drought Code continuously climbed through the early summer and reached a significant peak from September 16-30 in both areas, which again coincided with increased fire activity. However, this year the BUI never reached 70 at these two weather stations.

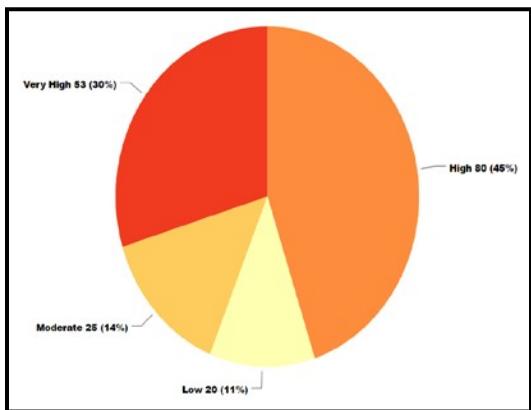
Number of Fire Class Days – Statewide Totals



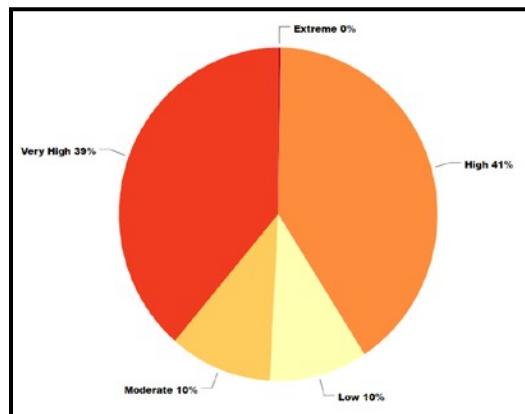
Fire Class Days, or Fire Danger, encompasses the chances of a fire starting as well as how difficult fires could be to suppress. Fire Danger is used as a way to educate the public on the fire conditions, to determine when to issue burn permits and to assure that the appropriate fire response resources are available for dispatch. The chart and graph above total the data from weather stations throughout the state to show a general overview of the fire danger. Local conditions may vary from this example, but this indicates that the 2017 fire season risk was lower than average.

Over the past 10 years, 37 percent of the fires have occurred on days with a fire danger rating of “Very High” or “Extreme”, 38 percent on “High” days and 25 percent on “Moderate” or “Low” days. But in 2017 the percentages showed that the weather greatly influenced the fire occurrence with more fires occurring on “High” days than any other days, with 45 percent of the fires. This is an indicator that the number of “Very High” and “Extreme” days were much lower than normal years.

Number of fires by Adjective Rating 2017

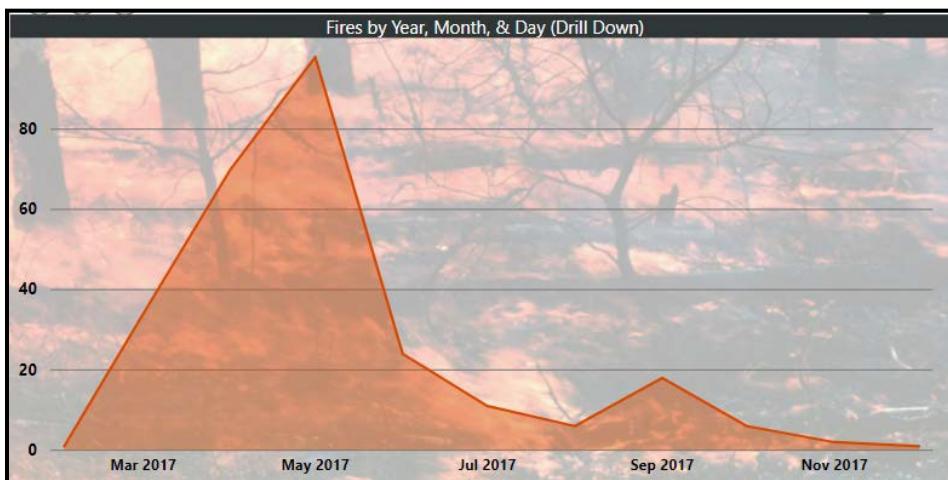


Acres by Adjective Rating 2017



Fires by Month 2017

In 2017, the fire activity was spread out over the year with a fire occurring in every month but January. The DNR responded to 271 fires over the year. The DNR took action on 178 of them and assisted the local fire departments on another 93 fires. A total of 75 percent of the fires occurred in March, April and May with June, July, and September making up an additional 18 percent. Having the fire activity heavier in the spring is more typical of a normal fire season. The chart below indicates the fire activity by month, and as mention in the weather section, fire activity picked up in mid-May and again in late-September.



Wildfire Occurrence and Suppression

2006 through 2017 totals

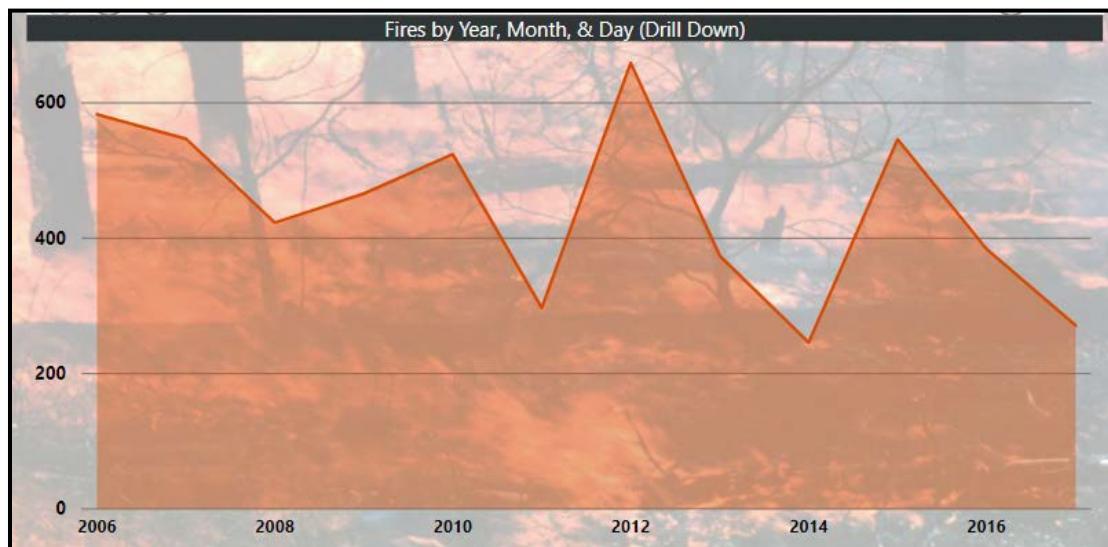
Report Type	Fires	Total Acres
Non-Statistical	1585	8,080.53
Reportable	3738	72,493.65
Total	5323	80,574.18

2017 only

Report Type	Fires	Total Acres
Non-Statistical	93	130.10
Reportable	178	568.90
Total	271	699.00

Even though the fire season risk was lower than average in 2017, FRD still experienced fires. Fortunately, the lower risk factors helped reduce the number of fires below our yearly average and kept fires smaller. The charts above provide statewide totals for fires and acres burned that FRD took direct suppression action on (reportable fires) and fires that FRD responded to and assisted local fire departments. The total response by FRD to wildfires in 2017 is 271, with 178 of those being reportable fires. There were no significant large fires in 2017. The 10-year average for reportable fire occurrence is 314 fires and the average for total acreage is 7,052 acres. The 10-year average for all wildfire response is 447 fires and 7,799 acres. 2017s total and reportable fires and acreage burned are well below the 10-year average.

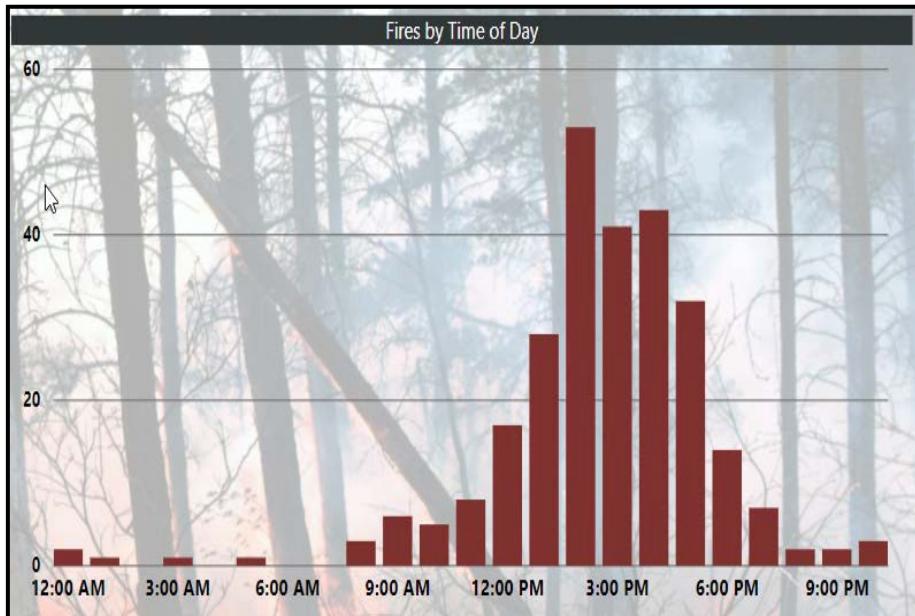
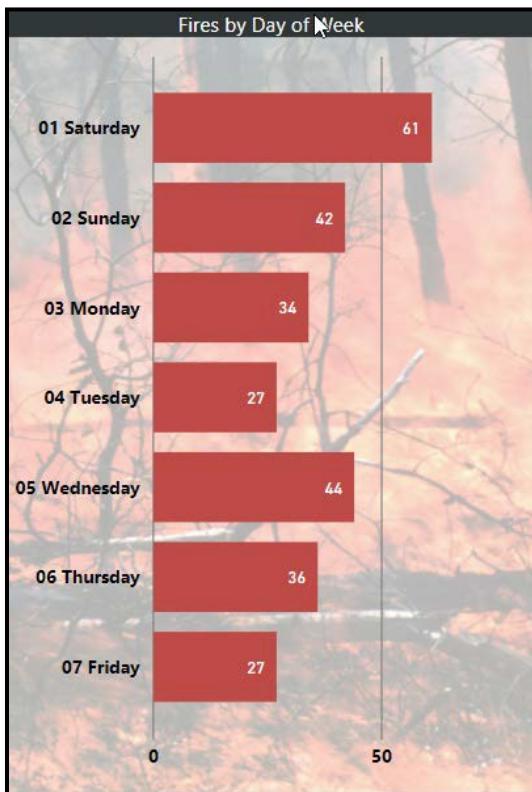
Number of Fires from 2006 through 2017



The charts below show the number of fires/acres by management unit, the days of the week and the times of day that fires occurred. Human-caused fires account for about 98 percent of Michigan's wildfires and weekends are typically the busiest days for fire activity, as more folks are out cleaning up their yards, having campfires, and spending recreation time in the woods. The hours between 9 a.m. and 7 p.m. are usually the driest, warmest, and windiest times of day, which leads to drier fuels and more frequent fires.

2017 Wildfires by Management Unit

Management Unit	Fires	Acres
Atlanta	11	16.5
Baraga	2	9.6
Cadillac	33	52.4
Crystal Falls	9	29.5
Escanaba	7	17.4
Gaylord	23	13.3
Gladwin	59	65.4
Grayling	24	42.5
Gwinn	4	24.9
Newberry	0	0
Plainwell	45	184.9
Roscommon	30	30.8
Rose Lake	5	63.4
Sault Ste. Marie	1	4.1
Shingleton	6	2.4
Traverse City	9	76.7
Other Agency Assist	3	65.2

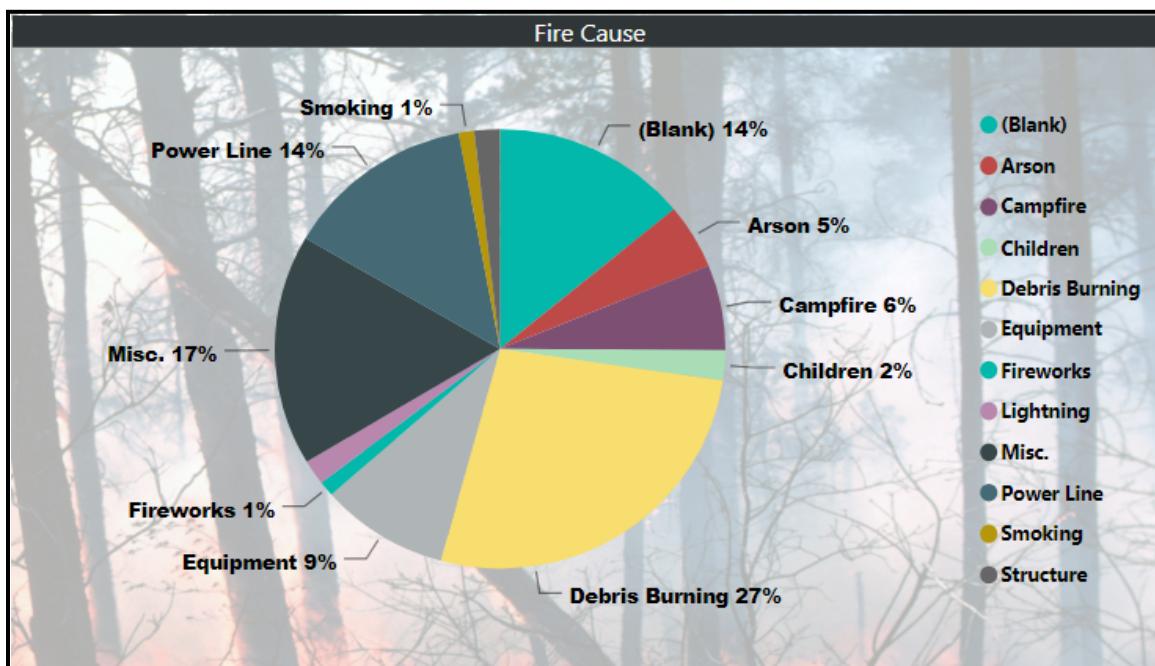


Of the reportable fires that FRD took direct suppression action on in 2017, 326 structures were threatened and 283 were saved. A total of 5 commercial structures, 10 residential structures and 28 out buildings were lost.

Commercial Threatened	Outbuildings Threatened	Residences Threatened	Total Threatened
15	144	167	326
Commercial Destroyed ...	Outbuildings Destroyed...	Residences Destroyed ...	Total Destroyed
5	28	10	43

2017 Fire Cause

The fire causes for 2017 are shown below in the pie chart. As with most years, debris burning at 27 percent represents a significant source of fire starts as does miscellaneous at 17 percent. The “miscellaneous” category represents a fire that cannot be properly classified under other general causes, or the cause was not determined. Power line and equipment-caused fires account for 23 percent of all fires. These fires are all human-caused fires and can be prevented; only lightning fires are not human-caused. Lightning accounts for very little fire activity in Michigan, especially during years of lower fire danger; around 2 percent is very typical. When lightning fires occur, they are usually more difficult to find, gain access to and extinguish because they often occur in remote areas.



*Percentages not shown include: Lightning: 2 percent; Structure: 2 percent

Suppression success stories:

- On May 6, the Atlanta Management unit responded to a fire that had spread through leaves and brush, catching the outside of a residence on fire. DNR crews were able to extinguish the fire before it spread to the interior of the house, saving the structure.
- The Atlanta crew also responded on May 8 to a fire that escaped from a burn barrel and had burned one garage with an upstairs apartment. The crew constructed a line around the fire, saving at least another six residences.
- The Traverse City Management Unit crews responded to a lowland marsh fire on state land that was difficult to access. Using a DNR airplane and pilot to help locate better access, the crew utilized a DNR conservation officers' boat and a county air boat to haul firefighters and equipment to the fire, keeping the fire in the marsh and away from other resources and values.
- The Ishpeming response area had a small zone fire in June that likely would have moved fast had it not been for a quick response from several sources. The 23-acre fire was detected by several people almost immediately after it started. The homeowners worked to suppress the active fire while they awaited emergency response agencies to arrive. Responding units from the DNR, Michigan State Police, county sheriff's department and five local fire departments quickly suppressed the fire. It was impressive and noteworthy how the local homeowners quickly responded to the zone fire. During periods of elevated fire potential, they have become very watchful for any fire activity in their community. Historically, the Ishpeming community has been plagued with years of large fire occurrences and has suffered great loss. They remain actively involved in fire detection and are resolved to keep fires small.
- In early summer, Fire Supervisor Paul Rogers received a call from St. Joseph County Dispatch about a large mulch pile fire. The local volunteer fire department was requesting assistance with air support. Rogers and Fire Officer Steve Schrader responded to the scene and found that approximately 8 acres of mulch that was 30- to 40-feet deep was on fire. All of the fire officers from the Plainwell Unit assisted throughout the remainder of the week to contain and extinguish the fire. We assisted with incident command help, pumps, hose, sprinklers and manpower. By the time the fire was out, more than 5 million gallons of water had been used. We were fully reimbursed for our time on this fire.
- Baraga unit personnel got the chance to work in positions they historically have not had occasion to participate in. It was good year to allow some closely watched mentoring to occur during initial attack operations. This will prove beneficial in the future for overall department operations as personnel gain experience in closely monitored situations.
- There was real progress made as we continue to build our cooperative relationships when responding to fires. There were several IA dispatches in which more than one agency responded. This could easily be written off as an eager attempt to get on an active fire due to a general lack of fire activity. The whole success of this practice was noted when a coordinated effort not only ensured a quick response but also gave adjoining agencies opportunities to network while witnessing and discussing fire behavior for any given fire. As discussion ensued, there seemed to be a better working relationship between agencies as the agencies continued to find ways to interact.

- Many management units were able to assign firefighters to new roles, allowing them to gain valuable experience and new qualifications.

Prescribed Fire

Prescribed Burns completed

FRDs goal is to complete at least 100 burns annually over 8,000 acres. 2017 resulted in a better than average year for the number of burns completed. The first burn occurred this year on March 23 and the last on October 19.

TOTAL BURNS			FRD		PRD		WLD	
Year	Number	Acres	%Number	%Acres	%Number	%Acres	%Number	%Acres
2017	111	9317	8/7%	1366/15%	20/18%	773/8%	83/75%	7178/77%
2016	75	8168	10/13%	580/7%	12/16%	1095/14%	53/71%	5404/79%
2015	131	7861	47/36%	3111/40%	15/11%	1037/13%	69/53%	3713/47%
2014	105	9815	26/25%	3801/39%	26/25%	1312/13%	52/50%	4713/48%
2013	36	2647	7/19%	762/29%	18/50%	970/37%	11/31%	914/34%
2012	46	4412	11/24%	807/18%	24/52%	1189/27%	11/24%	2416/55%
2011	61	3800	6/10%	950/25%	10/16%	290/8%	45/74%	2560/67%
2010	86	6367	15/17%	1247/20%	28/33%	2149/33%	43/50%	2971/47%
2009	51	2228						
2008	175	8364						
2007	49	3660						
2006	64	2989						
2005	42	3006						
2004	110	4235						
2003	112	4180						
Total	1254	81049						
Average	84	5403						

FRD = Forest Resources Division; PRD = Parks and Recreation Division; WLD = Wildlife Division

As can be seen in the chart above, 2008 was an unusual year with 175 burns, many of which were the result of Wildlife Division concentrating on pheasant habitat improvements and prescribed burning for many areas in the Thumb. The prescribed burning effort slowly declined for five years after 2008, with the lowest year being 2013 resulting in 36 burns for 2,647 acres. After 2013, FRD, Parks and Recreation Division and Wildlife Division determined that prescribed burning should become a priority to maintain habitat, reduce invasive species, promote native landscapes, reduce slash for planting and conduct fuels

management. For the past three years, burning numbers have averaged 105 burns for 8,790 acres. The size of burns has increased over the past four years as well, from an average of around 50 acres per burn to nearly 90 acres per burn. This can be attributed to more landscape types of burning, more efficient use of resources and better planning efforts.

2017 offered more opportunities to conduct unusual prescribed burns and allowed fire crews to learn more about fire behavior and working with other agencies and landowners. The pictures below are from one such opportunity where FRD staff conducted a prescribed burn at Milliken State Park in the city of Detroit. The Detroit Fire Department fire inspector was a little worried about this operation until he observed our careful planning and execution and realized we are very professional and knowledgeable in prescribed burning.



The chart above also describes what state lands FRD has been burning on. The majority of the burning over the past four years has occurred on Wildlife Division managed lands to assist with habitat improvements, including managing invasive species. Most Parks Division burns are to manage for native landscape, assist with reducing thatch and produce native seed sources. FRD burns are generally to reduce slash for either planting or fuels reduction, as well as for reducing competition and opening seed beds for red and jack pine. The pictures below are from several prescribed burns from 2017.





Prescribed Burn success stories:

- The lower-risk fire season allowed FRD to conduct more prescribed burns and burn under less-than-ideal conditions, which helped fire crews and burn bosses better understand fire behavior and fire effects on those kinds of days. This will help us with future planning efforts and will open up more burn days.
- FRD established monitoring plots on several burns and recorded data for evaluation and study.
- Introduced prescribed burning to the city of Detroit, which will make it easier to continue to conduct burns at Milliken State Park and at Belle Isle State Park.
- Conducted several burns in the Plainwell Management Unit for Wildlife Division to assist with oak regeneration.
- A new burn was conducted in the Robinson Creek Flooding State Wildlife Management Area, which is within FRD's Roscommon Management unit, for Wildlife Division. It required specialized equipment to operate in that area.
- One crew member assisted the Wisconsin DNR on a prescribed burn in the Spread Eagle Barrens across the border from Iron Mountain.
- Many firefighters, fireline supervisors and burn managers were able to participate in a number of burns this year, receiving valuable experience and gaining new qualifications to help both with burning and fire suppression.

Fire Planning

Throughout the year, it is important for local fire staff to maintain good working relationships with cooperators and partners. Meetings and trainings occur annually between local staff, local county fire departments and dispatch centers. This past year, fire officers attended more than 125 local meetings to coordinate training, develop fire ground communications plans, discuss fire tactics, inspect federal excess property assigned to departments and become familiar with how each agency operates.

Many agreements, memorandums of understanding, operating plans and other documents are updated yearly. These include those with our partners from the U.S Forest Service, Bureau of Indian Affairs, Fish and Wildlife Service, Border Agreement with Wisconsin, Operating plans with Partners in the Great Lakes Forest Fire Compact, Michigan National Guard, Michigan State Police, National Weather Service,

other DNR divisions and mutual aid agreements with all the local fire departments that have federal excess property assigned to them.

The State Fire Supervisor is an active member of the National Association of State Foresters, Fire Supervisors Committee. This committee meets as a whole every two years and regional committees meet annually. In 2017, the national committee did not meet but the Northeast 20 State Fire Supervisors met in June in Hanover, Maryland. Topics discussed at the meeting included: qualification standards, master agreement liability language, administratively determined (AD) or casual hire firefighters, state fire statistics, federal grants, stress first aid, National Cohesive Strategy, forest action plans and others. The 2017 meeting of the NEA Fire Supervisors was the wrap up for the 50th anniversary of the committee. The Michigan state fire supervisor also represents the NE Area State Fire Supervisors on the Complex Incident Management Course (CIMC) Steering Committee and one FRD staff specialist is a cadre member of that course.

Many of the FRD fire managers are members of committees as part of the Great Lakes Forest Fire Compact (GLFFC) which partners with Minnesota, Wisconsin, Ontario and Manitoba to coordinate activities and share information related to fire prevention, training, resources sharing, aviation, law enforcement and communications. The GLFFC met this year in Grand Bend, Ontario, with the focus being on prescribed burning and sharing the science and data. The GLFFC will add two new committees in 2018: one for prescribed burning and one for forest health. The Lansing state fire prevention specialist serves on the Michigan Interagency Fire Prevention Association, working committee with partners from the Michigan federal agencies, State Fire Chiefs and Firefighters associations and others. One Lansing fire specialist represents the GLFFC on the U.S. Forest Service Eastern Area Dispatch Working Team.

Annually in February, each FRD office reviews and updates the FRD Fire Plan located on the Wildland Fire Response web site. If there are any significant changes needed during the year, updates can be made as well. Zone dispatch plans and standby locations are reviewed and any changes are made prior to the first of April.

This past year and the previous several years, FRD has seen several experienced staff retire or move on to new roles. This has resulted in a large number of newer staff that have yet to reach the fire experience and qualification levels needed to perform all tasks. Succession planning is probably the most difficult planning issue the FRD fire program faces. FRD started reviewing national and state qualification guides and are looking at new ways to help newer staff become qualified. Training schedules and plans are set based on division staff needs. Staff are assigned with mentors to training roles on prescribed burns and fires and simulations are used where practical. FRD will continue this effort into 2018.

Air Operations

DNR/FRD's air program is housed mainly in Roscommon at the DNR Conservation Airport, where we have two pilots, one of whom is the program chief pilot and carries out missions primarily in the Lower

Peninsula. FRD also has pilots and aircraft located in Newberry, Escanaba and Houghton to serve the Upper Peninsula. The chief pilot oversees all aspects of the air operations program including budget, facilities, personnel, contracts and maintaining working relationships with partners and cooperators. The aircraft pictured below is a replacement aircraft purchased in 2017. It is a 2009 Cessna 182T with approximately 1,200 hours total time. We normally maintain aircraft to about 10,000 hours total time and this aircraft should serve the department for another 20 years.



The annual Air Operation Report is attached, but one highlight is a new program that the DNR and, more specifically, FRD has started. The DNR purchased three Unmanned Aerial Systems (UAS) to be administered by FRD and managed by Chief Pilot Kevin Jacobs and GIS Specialist Nick Dohm. These new tools will provide new opportunities and services to DNR users. Currently FRD has Dohm, Jacobs and two other pilots for the UAS, policies and procedures have been developed and accounting and scheduling has been set up. We hope to see this program develop and grow in the coming year.



Through the Great Lakes Forest Fire Compact, the DNR has entered into a “quick strike” agreement with our partners from Ontario to provide large air tanker and helicopter fire suppression resources when needed. We have also entered into a memorandum of understanding with Michigan State Police for the use of their helicopters for fire suppression that includes the purchase of a 320-gallon “Bambi bucket” to do water drops on fires. The purchase and training plans are still in process at the time of this writing.

DNR pilots flew 470 hours for fire detection in 2017. Our pilots also fly missions for a number of other divisions, as can be seen in the attached air operations report.

Fire Prevention and Public Education

Burn Permit Web Site hits – 134,139

Phone Contacts for Burn Permits – 46,170

FRD fire managers oversee the burn permit system for all agencies in the Northern Lower Peninsula and the Upper Peninsula. This system includes a web site and a call center (www.michigan.gov/burnpermit and 866-922-2876). In the Southern Lower Peninsula, permits are managed by local units of government or fire departments. The department and division, along with our federal and local partners, participate in the Michigan Interagency Wildfire Prevention Association (MIWFPA) to provide public education in wildfire prevention. FRD and MIWFPA have cooperated in the installation of several electronic Smokey Bear Fire Danger signs in key locations along major highways, education pamphlets and advertising through radio, TV and social media.

The GLFFC also has a prevention committee; two FRD staffers are assigned to work with it. The committee develops regional messaging for public education, designs and distributes fire-prevention products, coordinates activities between states and agencies and works with federal partners to meet national prevention goals.

FRD's fire specialist in Lansing manages a contract to send fire prevention out via billboards, radio and TV and social media. In 2017, 12,457 free public service announcements were aired to educate the public about fire prevention, and digital marketing efforts yielded 10 million impressions. In addition, there were 21,440 hits on the DNR FRD Wildfire web page.

	Staff hours spent	Number of public reached
Atlanta	108	1000
Baraga	50	1000
Cadillac	63	4000
Crystal Falls	48*	1000
Escanaba	80	200
Gaylord	250	7000
Gladwin	300	4000
Grayling	100*	1000*
Gwinn	75*	1500
Newberry	126*	5135
Plainwell	300	50000
Roscommon	300	24500
Rose Lake	72	3500
Sault Ste. Marie	16	500
Shingleton	60	600
Traverse City	100*	21000

Lansing and Coordination Centers	150*	5000
Total:	2198	130935

**estimated*

The hours in the chart above are field staff hours spent at local, county and community events as well as state events such as Detroit River Days, Michigan Firemen's Memorial Festival, Upper Peninsula State Fair and others. These events allow FRD staff to reach thousands of Michigan's citizens and visitors with Smokey's fire prevention messages.



The Crystal Falls Unit periodically contacts local railroads during VERY HIGH/EXTREME fire danger to discuss patrols behind trains and to raise awareness of possible fire starts. Fire weather information is made available electronically to chief train dispatchers during these time periods.

Fire Training

Through the cooperative efforts of the GLFFC and our partnerships with federal and state agencies, FRD was able to offer a variety of fire training classes and simulations. The GLFFC Training Committee is committed to providing higher level fire courses that individual states cannot carry out on their own. Courses such as Advanced Fire Behavior, high-level incident command and leadership courses are often offered through the compact. In February, a Michigan Incident Management Team attended the Complex Incident Management Course (CIMC) in Wisconsin where FRD has one cadre member and one steering committee member. With our in-state federal partners, we have planned and participated in an engine academy, fire investigation training and air operations training courses. The DNR and FRD conducted the following courses in 2017: S-330 Strike Team/Task Force Leader, S-339 Division Supervisor, FI110 Fire Origin and Cause, S-290 Intermediate Wildfire Behavior, S-390 Introduction to Wildfire Behavior Calculations, S-200 Intial Attack Incident Commander, and CIMC.

Because our firefighters are well-trained and have a variety of state and national experiences, we are able to provide high-quality fire training to our local fire departments, dispatch centers and county emergency managers. FRD and local fire departments often work closely together on wildfire

suppression, so training together is critical to smooth and safe fireline operations. Courses include Michigan Introduction to Wildland Fire, basic weather and fire behavior, wildland fire operations for fire department officers, fireline leadership and Incident Command System. In 2017, FRD conducted 12 different courses for local agencies (some multiple times throughout the state) that included 2,503 students amounting to more than 30,000 hours of classroom and practical training.

In 2017, 604 FRD firefighters also received 11,660 hours of training in 26 different courses. These courses included:

- Commercial Driver's License Class A for 6 students for 5,600 hours
- Basic firefighter courses for 79 students for 1,100 hours
- Mid-level fireline leadership courses for 45 students for 1,440 hours
- Advanced-level fireline leadership courses for 18 students for 720 hours
- Refreshers, simulations and tactics training for 456 students for 2,800 hours

FRD's goal this past year was to assist a number of firefighters reach the Engine Boss (ENGB) qualification, something we had identified as a weakness in our organization. This year, seven firefighters have reached the goal of ENGB and another three staff have obtained Incident Commander Type 4 qualification, which also is a key qualification needed on the fireline.

Number of staff receiving new qualifications in 2017:

- Firefighter Type 1: 1
- Incident Commander Type 5: 1
- Incident Commander Type 4: 3
- Commercial Driver's License A: 6
- Engine Boss: 7
- Heavy Equipment Boss: 3
- Firing Boss: 5
- Radio Operator: 2
- Prescribed Burn Boss Type 2: 2

To become fully qualified, a firefighter has to complete a formal training course; they must also complete a task book that demonstrates they are capable of performing the tasks of that position. They are observed by another qualified firefighter and evaluated prior to receiving that qualification. In some cases, this process can take up to three years to complete. Besides the staff here completing their task books, many other firefighters have initiated task books or are taking classes. This is an ongoing process as firefighters are always working toward their next qualification goal.

Fire Equipment

FRD maintains approximately 350 pieces of rolling stock fire equipment, including trailer-mounted pumps; ORV/UTV units; small, medium and large engines; dozers and tractor plows; skidders converted to engines; semi-tractors and trailers; tiltbed transports; marsh units; and command vehicles. This

equipment is housed at offices strategically located across the state to provide an appropriate response to wildfires. Of the 350 pieces of fire equipment, 184 pieces (52 percent) are 20 years old or older and 75 pieces (21 percent) are 30 years old or older.

In 2017, FRD was fortunate to receive a second, allocation of \$1 million for fire equipment replacement. Included with the annual operating budget, this allowed \$1.231 million to replace an aging fleet of wildland fire equipment. Even though FRD received the additional funding in 2017, most of the replacement equipment will be placed in service over the next fiscal year. The purchasing process for an identified list of replacement equipment was started, and in some cases equipment will need to be fabricated or modified at the Forest Fire Experiment Station over the next year. Items planned and ordered include: four large engines, two medium engines, three transport units, three UTVs, seven pumps and two marsh units, as well as several smaller items. Several of the engines and transport units were federal excess property that FRD converted into fire equipment.

In 2017, many FRD stations received new equipment. These included: portable pumps, several UTVs, four enclosed trailers to be used as prescribed burn trailers, four medium engines, three new tractor plows, one large engine and one small engine, two semi tractors converted from federal excess property freightliners, and several other smaller pieces of equipment.

Updated Facilities

FRD maintains 46 management unit and field offices that house fire response equipment and staff that are strategically located across the state to provide an appropriate wildland fire response. Of those offices, four received funding for repair and improvement projects. Atlanta installed a new shop furnace; Gwinn sided the garage; Shingleton did a number of exterior repairs including a new roof on the 10-stall garage and painting; Baraga put a new roof coating on the garage.

Federal Excess Personal Property and Firefighter Property Equipment Programs

FRD administers the Federal Excess Personal Property (FEPP) and the Department of Defense-Firefighter Property program (DOD-FFP) to make it possible for local fire departments to get wildland and structural fire equipment they need for a fraction of what it would cost otherwise.

More than 400 fire departments throughout Michigan have received excess federal property made available by the FRD. More than 800 pieces of equipment valued at more than \$19 million have supplemented firefighting units statewide. In 2017, 44 pieces of equipment were distributed to local fire departments and the DNR received 21 pieces of equipment. This equipment is used military equipment that, at original acquisition, was valued at \$5.1 million. Below is a picture of a DOD Freightliner semi converted to a transport truck.

The Rose Lake Management Unit has a warehouse which is the main depot of two depots for receiving and disbursing this federal excess property. The Rose Lake Warehouse received 548 pieces of equipment

valued at \$4.2 million and placed 44 pieces of equipment with a value of \$1.7 million to fire department in the Lower Peninsula.

The annual report is attached and additional information about the program can be found at www.michigan.gov/excessfireequipment.



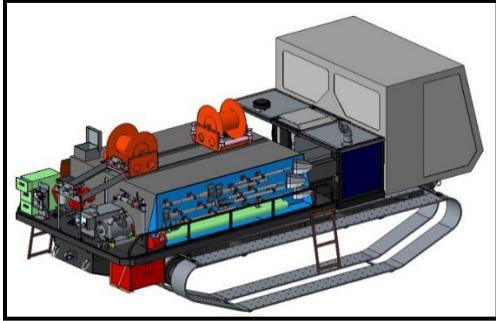
FRD also manages a pass-through grant called the Volunteer Fire Assistance Grant (VFA) given to local fire departments to purchase needed equipment, radios and tools for firefighting. In 2017, grants were awarded to 81 fire departments for a total of \$186,250.

Forest Fire Experiment Station and Roscommon Equipment Center



The Forest Fire Experiment Station (FFES) and Roscommon Equipment Center (REC) focus on the development of specialized equipment for forest-fire control. Activities include engineering new equipment, designing modifications for existing equipment and testing commercially available equipment. The FFES provides engineering and fabricating for many DNR projects, but the emphasis is on developing wildland fire equipment for Forest Resources Division. The picture above is a newly designed and built F550 4x4 small engine for the DNR. The REC program is housed in the FFES facility and is managed and carried out by the same FRD employees, but places emphasis on other state and local agency needs. The REC is funded through the National Association of State Foresters and each

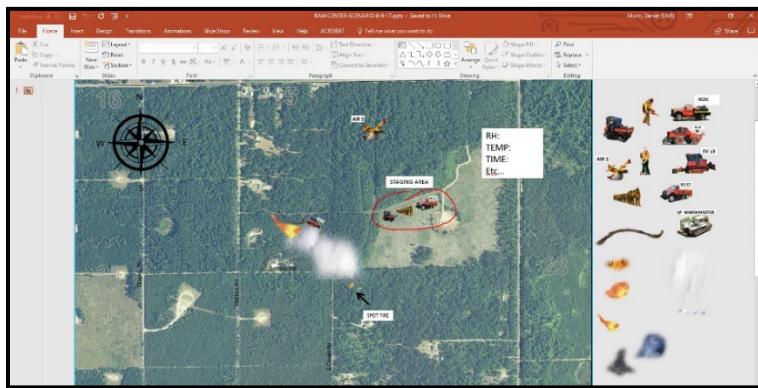
state contributes funds to support the effort. The REC has led in the design of converting excess U.S. military vehicles into fire control vehicles. In addition to the focus on wildland fire engines, the REC program pursues projects concerning fireline construction tools, specialized water handling equipment, commercial equipment evaluation and fire chemical delivery systems.



FFES Manager/Engineer Dan Munn is recognized nationally for the work conducted at the FFES and is a member of several national fire equipment committees:

- Equipment and Technology Committee (ETC) for the National Wildfire Coordinating Group
- Chair of the Mobile Equipment Subcommittee of the ETC
- Fire and Aviation Management Committee
- San Dimas and Missoula Technology and Development Steering Committee
- National Fire Prevention Association (NFPA) technical expert on mobile fire equipment for wildfire NFPA Standard 1906.

Below is one of the REC projects which is a simple sand table training tool that uses a large monitor and the ability to draw fires and place equipment and firefighters on scene to help make strategic and tactical decisions on fire operations.



The annual reports for the FFES and the REC are attached and further information can be found at <http://roscommonequipmentcenter.org/>.

Out-of-State Assignments and Incident Management Teams

Nationally, 2017 was an active year for wildland fires. This also meant Michigan's firefighting assistance was required nationally more than normal years. With Michigan having fewer fires than normal, the DNR and FRD were able to assist our other state and federal partners across the nation. Typically, the DNR dispatches 50 to 100 resources (personnel, equipment, etc.) to western states in July, August and September.

In 2017, FRD conducted nearly 140 dispatches to 13 states and two Canadian provinces including: Idaho, Oregon, Washington, Montana, Missouri, Oklahoma, Florida, Arizona, Nevada, Wyoming, West Virginia, California, British Columbia, and Ontario. DNR firefighters filled needed roles that included basic firefighter, engine boss, division supervisor, public information officer, safety officer, dispatcher, radio operator, status check-in recorder, facility unit leader, strike team leader, task force leader and others. This also includes several dispatches of large engines to Montana. In total, there were 34 engine assignments, 42 single-resource assignments and 39 crew assignments for a total of 133 individual assignments. The pictures below are from assignments in Montana.



FRD also worked closely with our federal partners from the U.S. Forest Service and the Bureau of Indian Affairs and our partners within the Great Lakes Forest Fire Compact. We were able to form multiple interagency crews and often provided leadership for those assignments. Having the agreements in place prior to the need has made these types of responses possible and easier to handle.

Through these national dispatch opportunities, the DNR assists other states and federal agencies in their time of need. The DNR is reimbursed for the costs, and Michigan firefighters gain valuable experience, improve their qualifications, build great working relationships and bring back new ideas to improve fire operations in Michigan. Michigan also has several staff on national Incident Management Teams (IMT). FRD has employees assigned to the National Eastern Area Type 2 IMT in roles that include operations section chief and safety officer. In the Pacific Northwest, FRD has a Type 1 public information officer assigned to a Pacific Northwest team. In the south FRD has a safety officer and status check-in recorder assigned to two teams, and our statewide fire dispatcher is assigned to an Eastern Area dispatch team. These folks bring a high level of experience back to Michigan. The picture below is of an FRD Fire Specialist giving a briefing as a operations chief on the Eastern Area Type 2 Incident Management Team in Montana.



In-state DNR and FRD firefighters and Incident Management folks often are asked to assist with local and state emergencies such as the flooding that occurred in mid-Michigan this past summer.

Isabella and Midland counties were hit hard by rain, causing flooding. People were stranded in their homes. Isabella County contacted Fire Supervisor Jeff Vasher for help and, after talking with the duty officer, FRD staff took a Marsh Master out to help rescue citizens, spending three days on site. Some residences were two miles into the flooded area. Isabella County was very appreciative of the help and specialized equipment that we provided. In Midland County, Fire Officer Jerry Turner took his Kubota with tracks to help rescue 75 people from a flooded neighborhood. Midland County was also thankful for the service.

Legislation

In 2017, House Bill 5198, sponsored by State Rep. Sue Allor, was introduced to change the Natural Resource and Environmental Protection Act, 1994 PA 451, Part 515, Section 51514 to allow the DNR to enter into agreements with other states, the federal government and the provinces of Canada for all-hazard response. The current law allows for agreements for forest fires only. The change will allow DNR staff to assist our neighbors and partners across the country in their time of need for natural disasters and other emergencies. The bill has since gone through the House and Senate committees and was signed by the governor about a month prior to the writing of this report. This is a good step forward and will also allow our staff to gain valuable experience and knowledge that they can use when Michigan experiences all hazard events.

The DNR and Michigan State Police have entered into a memorandum of understanding for using state police air resources to help suppress wildfires and protect values. MSP has recently obtained two federal surplus Bell "Huey" helicopters that we can outfit with a 320-gallon bucket. MSP will make those aircraft and pilots available to the DNR when fire conditions warrant.



MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

January 08, 2018

TO: Jim Fisher, Fire Management Section Manager,
Forest Resources Division

FROM: Kevin R. Jacobs, Aviation Manager

SUBJECT: MDNR Air Operations Fiscal Year 17 Report

2017 proved to be a unique flying year given the record low number of hours flown for forest fire detection and the absence of our Escanaba pilot, Gordon Zuehlke, due to medical reasons. The fire detection hours are prone to fluctuate from year to year, however, this fiscal year was rare even among the normal variation that is expected to occur. We were able to cover some of the hours missed by our absent pilot with a contract pilot, Mike Roth. Mike flew 52.9 hours utilizing a MDNR Cessna 182 to assist during the biennial moose survey.

At the tail end of FY17, the MDNR purchased (3) UAS to start a new program utilizing our existing pilots as well as Nick Dohm from GIS. Future annual reports will include UAS activity and is expected to add to the pilot billable hours. This is a program that has a lot of potential and should have a positive impact on the overall service provided to the Department.

The air operations program was featured in a television program (Wardens) on the Outdoor Channel. The flights involved excerpts from an elk survey, bait flight and night shining flight. They were scheduled to film in the U.P. on a moose survey, however, the weather caused the filming to be delayed and ultimately cancelled.

Once again, the air operations program supplied safe, efficient service to several divisions. My appreciation goes out to the dedicated pilots of the Michigan Department of Natural Resources.

FRD aircraft flew 1590.2 hours in FY17 compared to 1823.2 hours in FY16 for the following customers:

FMD	470.2 hours
Wildlife	736.5 hours
Law Enforcement	65.5 hours
Eagle Surveys	311.9 hours
ADM	6.1 hours

The total flight hours in FY 17 decreased by 233.0 hours from FY16. This decrease was due to significantly less fire detection. Flight hours for all other divisions stayed fairly level. Aircraft cost were comparable to FY16 with fuel cost lower by \$0.23 per gallon.

Cessna N97745, stationed in Roscommon, will be disposed of in FY18 as it has reached the airframe replacement hours. The replacement aircraft, N5101U, is a 2009 Cessna 182T with approximately 1200 hours total time. N5101U is poised to serve 20+ years for the Department and was acquired at \$60,000.00 under market value. The new aircraft had the MDNR radio package installed late in FY17 so it will see its first real service in FY18. The radio package included a Technisonics 136 high band and will meet the USFS radio requirements making it the only airplane in the fleet that meets their specifications. N6275S is scheduled for an engine change in FY18. None of the other department aircraft are scheduled for major expenditures for budget year 2018.

Fire detection contracts are in place for the fire season with the same vendors as the previous year. The majority of our fire detection area, including all of the Upper Peninsula, will be flown by MDNR pilots.

The aircraft hourly rates are as follows:

Cessna 172	\$125.00
Cessna 182	\$135.00
A-36 Bonanza	\$150.00

If there are any questions about the annual report, please contact me at your earliest convenience.

Kevin R. Jacobs
Aviation Manager
jacobs@Michigan.gov
989-275-5151 ext. 2053
989-370-4041 ©

Attachments:

Aircraft Utilization Reports
Pilot Time Monthly Summary
Aircraft Data Sheet
Pilot Flight Status
Aircraft Cost Analysis

cc: Harri
Minett
Wilke
Zuehlke
Chingwa
Klingler

WG:rd

Annual Report

Roscommon Equipment Center

2017

Introduction

Now in its 47th year the Roscommon Equipment Center Programs (REC) main function is to provide technical assistance related to fire suppression equipment to state wildfire agencies and rural fire departments. With the support of the state wildfire agencies and the National Association of State Foresters the REC program will continue to provide that assistance.

During this year, sudden design break-through's have occurred spawning News-Note #22 and work has continued on current projects. See the Project Progress section below.

Administration

REC Steering Committee

This committee did not meet during 2017.

REC Project Committee

The 2017 Project Committee did not meet during FY17.

Project Proposals

REC staff did not solicit project proposals this year.

Project Progress

Completed Projects:

1. A "Simple Electronic Sand-Table" – News-Note & Michigan Prototype **COMPLETED**
 - a. This project was conceived by REC & Michigan DNR staff to eradicate some of the problems associated with usage of a classical "sand-table".

Current Projects:

2. M1078 & M1083 FMTV
 - a. Project intent is to assess the suitability of these vehicles as watertenders
 - b. MI DNR is aware of the design problems presented by using this type of "cab-over" design as an engine and its maneuverability through a wild-land setting
 - c. REC Administrator & the State of Michigan have obtained a suitable vehicle to use for a prototype.
 - d. Design work will begin this Winter.
3. M915 Freightliner conversion to a straight-bed transport unit for hauling Crawler Tractors (Second REC Priority)
 - a. To assess the suitability of extending the frame of a Military M-915(Freightliner), and installing a dove tail type flatbed for use as a safe and effective dozer transport.
 - b. Michigan DNR is currently engaged with this project.
 - c. (2) Prototypes have been built by 2 separate contract manufacturers.
 - d. These 2 prototypes have been jointly tested by REC & Michigan Fire staff. REC is working towards overcoming weight distribution issues that create the need to obtain over-weight permits on Michigan roadways. REC's intention is to publish a full report when these issues have been overcome.

Future Projects:

4. M915 & M916 Freightliner conversion to water tankers
 - a. To assess the suitability of converting the M-915 & M916 Freightliner's to water tankers for VFD use and determine a suitable design for a tank and maximum gallons that can be safely transported.
 - b. The Michigan DNR & REC will be engaged with converting these machines into wild-land enginesoon. The tanker type project will be completed in parallel with this endeavor.

Communications

REC Equipment Workshop

The 2017 REC Equipment Workshop was held September 11-15th.

- This year we had 3 attendees representing 2 different states/agencies. (This years' REC workshop was to be held jointly with the National Wildfire Coordinating Group's (NWCG's) Equipment and Technology Sub-Committee (ETC) Fall meeting. Unfortunately, due to increased fire activity within the Western United States prevented many attendees to cancel.
- During the week the attendees learned what services that REC can provide. Each state/agency gave a short wildland fire equipment presentation specific to them and shared those with the group to learn what other states are doing equipment wise to combat wildfire. The attendees learned about & operated both Michigan and Wisconsin constructed fire equipment on our facilities' grounds and toured the scene of Michigan's "Mack Lake Fire" in Mio, Michigan.
- The 2018 REC workshop will be held on October 1 – 5, 2018
- Michigan Fire Chief's & Local VFD's (chief level personnel) have been invited to annual workshops and will continue to be. REC staff has been participating as a vendor at their functions to spread the word about REC engineering design assistance that may be a benefit to their organizations.

Memberships & Meetings

The REC Administrator is a member of the Equipment & Technology Committee (ETC) (formerly the Fire Equipment Working Team) of the National Wildfire Coordinating Group (NWCG) and is currently the ETC's "Chair" of the mobile fire equipment sub-committee.

The REC Administrator is a member of the US Forest Service Fire and Aviation Management Steering Committee. This committee reviews project proposals submitted for the USFS Tech Development Centers.

The REC Administrator toured Wisconsin's fire equipment manufacturing facility in Tomahawk WI. On July 24th 2017.

The REC Administrator attended the Spring ETC meeting that was held in Boise, ID, April 24th to April 28th.

The REC Administrator attended the Technology & Development Steering committee annual meeting in Albuquerque, NM on Jan 30th to Feb 2nd 2017.

The REC Administrator hosted and presented the REC program to the REC Equipment Workshop attendee's that was held September 11th to September 15th in Roscommon, Michigan

Looking Forward

The REC work schedule for 2018 will include the continuation of work on already identified projects as budget allows.

The REC Administrator will continue working with the programs associated with NWCG as a member of the Equipment & Technology Committee and related groups or committees.

The REC staff members will continue to participate in Regional and National meetings to present the REC program to firefighting organizations that could benefit from REC design assistance

The 2018 Workshop is tentatively scheduled for October 1-5, 2018

Forest Fire Experiment Station (FFES) Production Report

2017

The main production efforts this year were centered around the addition of firefighting vehicles to Michigan's fleet. As always, the FFES continues to create products that will best serve the needs of Michigan Wildland Firefighters and allow them to continue to help protect life and property of Michigan residents. A complete listing of products that the FFES created follows below:

Medium Water Units:

- (2) Ford F-550 & (1) Ford F-450 wildland firefighting vehicles were created and deployed to the field.
- A winch recovery kit was identified and approved for field use. This will now be a standard piece of equipment upon development of a medium class water unit.

Tractor-Plow Transport Units:

- (2) Straight-bed transport units were created/tested and deployed to the field

Tractor Plows:

- (3) John Deere 550K tractor was outfitted with a Michigan Fire-line plow and deployed to the field
- (3) John Deere 550K tractor's front grill structures were modified to allow better operator night-time visibility
- LED replacement lights for 550K tractors were identified, tested and approved for field use.
- (2) John Deere tractors were equipped with rear vision camera systems.
- A drip-torch holding bracket was designed and installed on several of Michigan DNR's 550K Tractor-plow units.

Marsh Units:

- (2) tracked vehicles were identified & tested. These machines have been designed to become firefighting vehicles and to be able to traverse difficult terrain where a conventional wheeled vehicle may not be able to operate. Production to equip them with firefighting packages will begin in 2018.
- The Lower Peninsula's Marsh Master unit was outfitted with:
 - A white colored LED strobe light, mounted on the roof of this vehicle for better visual detection while operating in smoke filled environments.

Forest Health Projects:

- The FFES, being geographically central in the state has become a collection and drop-off point for disbursement of vibratory blades used to combat Oak Wilt disease throughout Michigan. This fits well within the State's plan for managing this disease as the staff at the FFES design, create and complete maintenance on these blades to ensure their readiness.
- Several Vibratory blades were refurbished after being damaged and made ready for field use once again.

Cultivation Projects:

- (1) CASE 850E bulldozer used in cultivation work, had hinged cab doors fabricated and installed by the staff of the FFES. This will promote operator safety while using this machine.
- (1) Hitch device was created to be able to pull a roller-chopper with a bulldozer.
- (1) Forestry Skidder has had a herbicide/pesticide apparatus designed to fit upon it. Production of this bolt-on apparatus will allow Michigan DNR staff increased beneficial chemical spraying capabilities.

General FFES Projects:

- A new breakthrough product/concept called: "Simple Electronic Sand Table" was created. This new way of using existing technology allows easier and more realistic sand table exercises to be completed with photo realism, less setup/cleanup time and transportation difficulties. This sand table is fully digitized and operates only with Microsoft Power-Point and digital photo's the user has available.



MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

March 6, 2018

TO: Jim Fisher, Manager, Fire Management Section
Forest Resources Division

FROM: Jack Schultz, Federal Excess Property Program Coordinator
Forest Resources Division

SUBJECT: 2017 Annual Report, FEPP and DoD Firefighter Program

January 1, 2017 to December 2, 2017

Equipment

- 31 Vehicles, to include 5 fire trucks
- 16 Pieces of heavy equipment, loaders, graders, backhoes, and forklifts.
- 5 Trailers
- 8 SUV's
- Numerous miscellaneous items, to include repair parts, engines, transmissions, tires, pumps, generators, and compressors.

Equipment Distributed

- Placed 44 pieces of equipment worth **\$1,604,625** to fire departments.
- The following equipment was put into service with the DNR:
 - 3 trucks, 3 SUVS, 5 trailers, 10 pieces of heavy equipment
 - Total value of equipment put in service **\$678,410**
- 16 pieces of equipment were returned to the DNR by fire departments

Total value received **\$5,099,848**.